

# COMPOUND BOW RIFLE SIGHT SYSTEM

## 5 CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation-in part of co-pending Application No. 10/395,348 filed March 24, 2003 which was a continuation-in-part of Application No. 09/922,289, filed August 3, 2001 and now abandoned.

## 10 BACKGROUND OF THE INVENTION

The present invention relates to bow sights and more particularly to a new compound bow rifle sight system which eliminates the need for a peep sight on a bow. The sight aids the archer in maintaining a consistent body form for accuracy which is crucial to the archer. The sight of the invention is designed to be used in conjunction with a front mounted sight, such as a pin sight, which is used in aiming of a bow and an arrow to be fired by the bow at a target.

## DESCRIPTION OF THE PRIOR ART

20 The use of various bow sighting and aiming systems is generally known in the prior art, as evidenced by the sighting systems disclosed in US Patent numbers 5,303,479; 4,620,372; 5,048,193; 5,802,726; 6,026,799 and design patent 423,627.

25 Known sight devices, such as pin sights, are mounted forward of the bow and away from the user of the bow when the bow is being held in use by an archer. The known pin sights require a peep sight that is mounted in the bow string to the rear of the bow so that the peep sight is carried by the string and is generally positioned between the pin sight and the user. The combination of the bow mounted pin sight and the string mounted  
30 peep sight is intended to produce an accurate aiming of the arrow toward the distant target. In use of the prior art the archer draws back the string of the bow to a set point that the archer is comfortable with, the peep sight should then be close to the eye of the archer and oriented so that the pin sights are visible through a hole in the peep sight. A string line fixed to the bow is often used to properly orient the peep sight.

35 The use of a peep sight with or without a pin sight has a number of drawbacks. The movable peep sight defines a small hole for the archer to peer through in aligning a shot. One problem with peep sights is that the material surrounding the peep sight hole will obscure the view of the archer. The peep sights commonly in use give the archer about a  
40 10 degree diameter field of view, anything outside this circle of view is obscured. In low light conditions it can be difficult to locate a target through the peep sight. Because the peep sight is so close to the archer's eye it is not possible to see any peep sight structure that would aid the archer in alignment, the archer's eye is focused at 10 to 40 yards where the target is. So instead of having something like cross hairs to align with  
45 the correct pin, the archer just has 3 or 4 pins floating in a hazily defined 10 degree circle. The archer then attempts to center a pin in the 10 degree circle with the pin over the target. Good archers do this successfully but it takes time to acquire the target and any

bow hunter will tell about the buck that got away while the archer was attempting to 'get a bead' on the target buck. It is also very easy to get a pin on a target and miss the shot because of misalignment of the archer's head and eye relative to the peep sight or because the bow, bow string or peep sight are misaligned. Commonly, the archers eye  
5 can be left, right, high or below the center of the peep sight, the archer can sight in the bow with a pin on the target but the shot for example will go left because the archer's eye is slightly right of center of the peep.

As can be seen there is a need for a bow sight that will not have all the problems  
10 associated with the prior art. Specifically there is a need for an improved bow sight that will eliminate the alignment and field of view problems associated with the peep sight.

## SUMMARY OF THE INVENTION

15 In view of the foregoing disadvantages inherent in the known types of bow sights now present in the prior art, the present invention provides a new compound bow rifle sight system for replacing the string mounted peep sight on the bow.

The present invention is a bow sight system that includes a bow sight assembly  
20 comprising a base plate with a longitudinal axis for mounting on the bow, and a sight assembly having a sight groove which is preferably a V-shaped notch. The sight assembly is mounted on the base plate so that the sighting assembly is adjustably movable along an axis that is substantially perpendicular to the base plate to adjust the position of the sight groove of the sighting assembly in a horizontal direction, and is  
25 adjustably movable in a plane that is substantially perpendicular to the longitudinal axis of the base plate to adjust the sight groove in a vertical direction. The system may include a pin sight assembly mounted in a position forward of the bow.

There has been thus outlined, rather broadly, the more important features of the invention  
30 in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional features of the invention that will be described hereinafter and which will form the subject matter of the claims appended hereto.

35 In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other  
40 embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

It is an object of the present invention to provide a new compound bow rifle sight system  
45 for aiding in the aiming of a bow.

It is a further object of the present invention to provide a compound bow sight that will correct bow torque and misalignment and allow the archer to maintain the same consistent body form time after time, which is crucial in accurate aiming of the bow.

- 5 Yet another object of the present invention is to provide a new compound bow rifle sight system which includes a bow sight assembly comprising a base plate with a longitudinal axis for mounting on the bow, and a sighting assembly having a sight groove which can be a V-shaped notch. The sighting assembly is mounted on the base plate so that the sighting assembly is adjustably movable along an axis that is substantially perpendicular to the base plate to adjust the position of the sight groove in a horizontal direction and is mounted on the base plate so that the sighting assembly can be adjustably movable in a plane that is oriented substantially perpendicular to the longitudinal axis of the base plate to adjust the position of the sighting assembly in a vertical direction. The system may include a bow and the bow sight assembly is mounted in a position rearward of the bow.
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- 15 The system may include a pin sight assembly mounted in a position forward of the bow.

- Still yet another object of the present invention is to provide a new compound bow rifle sight system that can be retrofit to an existing bow to replace the peep sight previously used thereon and which may be used in combination with virtually any type of forward mounted sight assembly including pin sights.
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- Yet another object of the present invention is to provide a new compound bow rifle sight system using an adjustably sighting groove and a pin sight in combination. The system providing a thickness of the sighting V groove such that a misalignment of the archer or bow will cause the sighting groove to obscure the pin from view thus preventing an errant shot.
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- It is still another object of the present invention to provide a sighting groove that will provide a wide field of view while also providing the archer with reference points including a groove and alignment points to allow for accurate repeatable aiming of the bow. While providing a wide field of view the present invention does obscure unused pins to provide a less cluttered field of view for the archer allowing a more rapid acquisition of the target.
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- 35 It is also an object of the present invention to provide a targeting system that will obscure unused pins while at the same time providing an indication of target distance by the number of pins that are visible.

- These and other objects of the present invention will become more clear in the following detailed description of the invention with reference to the drawings.
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## BRIEF DESCRIPTION OF THE DRAWINGS

- Figure 1 is a side view of the compound bow rifle sight mounted on a bow;
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Figure 2 is a perspective view of a first embodiment of the present invention;

Figure 3 is a front view of the first embodiment;

Figure 4 is a side view of the first embodiment of the invention;

5 Figure 5 is a perspective view of a second embodiment of the invention;

Figure 6 shows additional details of the embodiment of Figure 5;

Figure 7 shows a view of the pin sights as seen with the prior art;

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Figure 8 a, b and c shows details of the appearance of the pin sights as seen with the present invention embodiment of Figure 5 or 10;

Figure 9 shows a portion of the embodiment of Figure 5 or 10; and

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Figure 10 shows a third embodiment of the present invention mounted on a bow.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

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Referring now to Figure 1, the bow sight system 10 of the present invention may be suitably used in combination with a pin sight assembly 1 that is mounted on a forward portion of a bow 2. A string 3 is mounted on the bow 2 at a location rearward of the bow 2 toward the user when the user is holding the bow for use. The pin sight assembly 1 can have one or several pins 4 that define a point in space forward of the bow 2. A rest 6 can support an arrow 7 having a direction of flight indicated by dashed lines 8.

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In a first embodiment of the invention, illustrated in Figures 1-4, the bow sight system 10 generally comprises a first plate 12 having a first side 14 a second side 16, a top edge 18 a bottom edge 20 a first side edge 22 and a second side edge 24. An elongated slot 26 extends through the first plate 12 and generally extends between the top edge 18 and the bottom edge 20 that can be 3-4 inches.

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A second plate 30 can have a first side 32, a second side 34, a top edge 36, a bottom edge 38, a first side edge 40 and a second side edge 42. The second plate 30 has a ninety-degree bend 44 therein extending between the top edge 36 and the bottom edge 38 and positioned nearer the second side edge 42 than the first side edge 40 of the second plate 30. The second side edge 42 of the second plate 30 is integrally formed with the first edge 22 of the first plate 12 at a generally perpendicular angle such that the first plate 12 lies in a plane oriented generally parallel to a plane of the second plate 30. The first plate 12 extends in an opposite direction to the second plate 30. A pair of apertures 46 extend through the second plate 30. The apertures 46 are spaced from one another. Each of the aperture 46 is elongated in a direction perpendicular to an axis through slot 26. Fasteners (not shown) can extend through apertures 46 to secure the bow sight system 10 to a bow 2 which commonly have threaded holes corresponding to the spacing of apertures 46. The elongated nature of the apertures 46 allows the device to be

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selectively moved on the bow 2 to optimize the distance of a sight 50 from the pins sight assembly 1 while preventing interference with the bow string 3. The aperture 46 will also allow for differences in hole spacing on different bows 2 to which the system 10 might be retrofit.

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A sight 50 is positioned in and movable along the elongated slot 26. The sight 50 can comprise an elongated threaded member 52 having a first end 54 and a second end 56. The elongated member 52 can extend through the slot 26. A pair of securing members 58 and 58a are threadably coupled to the elongated member 52 for removably securing the elongated member 52 to the first plate 12. The first plate 12 is secured between the securing members 58 and 58a each of which can be a nut. A disc 60 is attached to the first end 54 of the elongated member 52. The disc lies in a plane oriented perpendicular to the plane of the first plate and perpendicular to a line defining the direction of arrow flight to a target not shown. The disc 60 has an edge with a V-shaped groove 62 therein. Alternatively, the disc 60 may have a rectangular shape, or other geometrical shapes in place of the round shape. Of importance is the V-shaped groove 62 which is used for sighting purposes.

A second embodiment is shown in Figures 5 and 6 and can best be understood with reference to Figure 1. A bow sight 70 includes a base plate 72, a sighting assembly 74, and optionally a light assembly 120. The base plate 72 can be mounted on the bow 3 and has a front 78 and a rear 79. The base plate 72 may have a mounting portion 80 and a support portion 82 that extends from the mounting portion 80. The mounting portion 80 and support portion 82 can be substantially coplanar. The base plate 72 may be elongated in a longitudinal direction and have a longitudinal axis extending in the longitudinal direction of the base plate 72. The mounting portion 80 may include a first mounting slot 84 for receiving a fastener (not shown) for mounting the base plate 72 to the bow 3, and may include a second mounting slot 86 for receiving a second fastener (not shown) for mounting the base plate 72 to the bow 3. The first and second mounting slots may be substantially parallel. The mounting portion 80 may also have a mounting aperture 88, which may be located between the first 84 and second 86 mounting slots.

The support portion 82 may comprise a neck portion 90 and an adjustment section 92. The neck section 92 of the support portion may be mounted on the mounting portion 80, and the neck section 92 may extend outwardly from the mounting portion 80. The adjustment section 92 may be oriented substantially transverse to a longitudinal axis of the neck section 90. The support portion 82 may include a support slot 94, which may be located on the adjustment section 92. The support slot 94 may be oriented substantially perpendicular to the first 84 and second 86 mounting slots.

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The sighting assembly 74 may guide the aiming of the bow 3 by eye of the user of the invention such as by correcting the body alignment with the bow 3. The sighting assembly 74 may be mounted on the base plate 72 in a manner that permits adjustable movement of the sighting assembly 74 on the base plate 72. The sighting assembly 74 may be adjustably movable on and with respect to the base plate 72 in directions that are perpendicular to the longitudinal axis of the base plate 72. The sighting assembly 74

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may also be movable in a plane that is oriented perpendicular to the longitudinal axis of the base plate to permit adjustment of the orientation of the sight in a vertical direction when the invention is mounted on a bow 3.

5 The sighting assembly 74 may include a pedestal 96 that is slidably mounted on the base plate 72. The pedestal 96 may have a channel 98 formed therein, and the channel 98 may extend substantially perpendicular to a plane defined by the base plate 72. A set screw set hole 100 may be formed in the pedestal 96 and may be in communication with the channel 98, and a set screw 102 may be positioned in the set screw hole 100 such that  
10 rotation of the set screw 102 in a first direction moves the set screw 102 inwardly with respect to the pedestal 96.

The pedestal 96 may include an anchor member 104 that is positioned adjacent to the base plate 72. The channel 98 may be formed in the anchor member 104 in a location  
15 that is opposite of the base plate 72. The pedestal 96 may also include a backing plate 106 that is positioned on a side of the base plate 72 at a location that is opposite of the anchor member 104. The pedestal 96 may also include at least one fastener, and preferably includes a pair of fasteners 108, 109. The channel 98 may extend through the anchor member 104 and through the backing plate 106.

20 The sighting assembly 74 may also include a mast member 110 that is mounted on the pedestal 96. An end portion of the mast member 110 may be positioned in the channel 98 of the pedestal 96. A position of the mast member 110 in the channel 98 may be adjustable along an axis that extends substantially perpendicular to the plane of the base  
25 plate 72. The set screw 102 may be selectively abutable against the end portion of the mast member 110 that is positioned in the channel 98 for securing a position of the mast member 110 with respect to the pedestal 96.

The sighting assembly 74 may also include a sight guide 112 that is mounted on the mast  
30 member 110, and the sight guide may have a top 114 for orienting upwardly and a bottom 115 for orienting downwardly when the invention is mounted on a bow 3. The sight guide 112 may include a sight groove 116 that is formed therein, and the sight groove may have a substantial V-shaped cross section to form a V shaped notch. The sight groove 116 may extend from the top 114 of the sight guide 112 toward the bottom 115 of  
35 the sight guide 112. The thickness of the sight groove, from front to back should be sufficient to assure that the user's view through the groove is substantially parallel to the plane of the support portion of the base plate 72. If the bow 3 is turned relative to the user about a vertical axis, the user will not be able to see the pin of the pin sight 1. (See Figure 9 and detailed description of Figure 9).

40 The sight guide 112 may also include a pair of alignment marks 118,119 that are marked on the sight guide 112. Each alignment mark 118, 119 may comprise a dot and the dots may be located on opposite sides of the sight groove 116. The alignment dots 118,119 may be located adjacent to the top 114 of the sight guide 112 and can be painted with  
45 highly reflective or florescent paint or the alignment dots 118, 119 can be lighted fiber optics to aid the user in seeing them even in low light conditions.

Figure 6 also shows that a light assembly 120 can be mounted on the base plate 72 for illuminating the alignment marks 118, 119 on the sight guide 112 as well as the V notch groove 116. The light assembly 120 is mounted on the base plate 72. The light  
5 assembly 120 may have a first bracket portion 122 and a second bracket portion 124. The first bracket portion 122 may be positioned adjacent to the base plate 72 and the second bracket portion 124 may extend from the first bracket portion 122. The second bracket portion 124 includes a light 126. The light 126 can be battery powered and can operate at a frequency that will not distract the archer and yet one that will cause the  
10 alignment marks 118, 119 to glow visibly.

Figure 7 shows a view of the pin sights 209 through the central hole 207 of a prior art peep sight 200. The prior art peep sight 200 is typically mounted in the bow string 203 and can include a line (not shown) that anchors to the bow 2 such that when the bow  
15 string 203 is drawn back into a firing position the peep sight will be forced into a position as shown where the pin sights are visible. Without the bow string 203 drawn the peep sight 200 is not aligned such that the pin sights 209 are visible through the central hole 207. Also when looking through the peep sight 200 the central hole is typically surrounded by the body portion 205 of the peep sight 200 which obscures the vision of  
20 the archer to all but what is visible through the central hole 207. The central hole 207 provides a field of view of about 10 degrees, large enough to see all the pin sights 209, 210, 211 and 212. Often there are 4 different colored pin sights each for targeting a different distance, the position of each pin is typically set by the archer based on their particular experience and on the power of the bow. Seeing all 4 pins 209, 210, 211 and  
25 212 at once clutters the field of view through the central hole 207 and can slow the targeting process as the archer must think through the distance and use the appropriate pin. Experience has also shown that the lines, not shown, are usually small diameter rubber hose and easily get bumped off so that the peep sight does not work. Many archers do not use the peep sight because of the problems described, relying instead on an  
30 anchor point. The anchor point involves muscle memory and the ability of the archer to bring the bow 2 back to exactly the same point, the anchor point, such that the archers eye, head, arm and body are in exactly the same relationship with the bow 2 such that the archer can sight the bow 2 merely by setting the appropriate range pin on the target and releasing the arrow. This method of archery has the advantage of speed to release and  
35 avoids the problems with the peep sight, but also limits the accuracy of the shot that can be obtained to the limit of muscle memory of the archer.

Figures 8a, 8b and 8c detail another advantage of the present invention. Figure 8 a shows the view of the pin sights 209, 210, 211 and 212 and archer would have using the  
40 sight guide 112 and groove 116 with a ten yard shot. Pin 209 is centered in the V notch groove 116 and aligned horizontally with the alignment marks 118 and 119. Seeing only one pin tells the archer he is aligned for making a ten-yard shot. As can be seen the archer has a relatively uncluttered field of view and has an unlimited size field above the sight groove 112. This unlimited field allows the archer to acquire the pin, target and  
45 alignment very quickly...like a rifle sight...just point and shoot.

Figure 8b shows the arrangement for a twenty-yard shot, 2 pins visible tells the archer he is aligning a 20 yard shot. Similarly figure 8 c shows three pins for a thirty-yard shot. Though the archer has an unlimited field of view, the archer also has reference points, the V groove 116 and alignment marks 118 and 119 that help the archer align the bow 2 and find the target. In the prior art the target and pins are floating and only muscle memory will help the archer. With the present invention the archer has more to guide than just muscle memory. An anchor point will still help the archer using the present invention, but its effectiveness is less dependent upon muscle memory and it will correct a poorly aligned shot by preventing the archer from seeing a pin if the bow 2 is misaligned.

Figure 9 shows the view an archer would have using the present invention if the bow 2 or some aspect of the archer's body is misaligned. In this case the archer's eye is to the right of perfect alignment with the groove 116. Bow 2 position or the archer's head position could cause this condition. With the prior art the archer could have made the shot and even thought the pin 209 could have been right on target the shot would have gone to the right of target. But with the present invention the archer is warned that the shot is misaligned because the pin 209 is obscured. Note that the pin 209 is in the back V but to the right of the front V of the groove, this is how the thickness or distance between the front and back V assures the accuracy of the shot. If the guide 112 were thin it would not have this property. Experience has shown that a thickness of about  $\frac{1}{4}$  inch is very effective for the sight guide 112.

Figure 10 shows details of a third embodiment of the present invention. This embodiment uses the same sighting assembly 74 as the second embodiment of Figure 5 but is mounted to the bow 302 differently. In this embodiment mounting plate 370 is bolted to the bow 302 using bolts 304. Holes 306 can be used to mount a pin sight assembly 1. Adjust of the third embodiment comes from a slider 310 mounted in a slot 308. A set screw 312 can be used to lock the slide 310 in place relative to the slot 308. The slider 310 can carry a mounting plate 379 with a slot 394 that can provide an adjustable mounting for the sighting assembly 74 shown in the embodiment of Figure 5. The embodiment of Figure 10 shows a complete arrangement as might be used on new bows 302 manufactured with the rifle sight as original equipment. Such a bow is likely to include arrangements for mounting a quiver of arrows and for mounting the pin sights. Holes 314 can be used to mount a quiver of arrows(not shown). Slot 394 in plate 379 will support the mast member 110 and sighting assembly 74as shown in the embodiment of Figure 6.

In use, the device is generally used in conjunction with a sight mounted forwardly on the bow 2 such as pin sight 1. The bow sight assembly of the present invention is attached to a bow 2 in a position rearward of the bow 2 toward the user. The sight is positioned and adjusted to suit the archer and the characteristics of the bow such as size and poundage of draw. The archer then lines up the V groove 116 of the sight assembly 74 with the appropriate pin 209 as shown in Figure 8a for a ten yard shot. The archer then visually sets the pin on the target and releases an arrow. In general the greater the thickness of the sight guide 112 and the greater the distance between the groove 116 and the pin sight 1 the greater will be the accuracy of the arrangement. The embodiment of



Figure 10 can give the archer more range to adjust the distance between the groove 116 and the pin sight 1.

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